

# PLUS SEARCH

**Butler, Douglas**

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**From:** PLUS  
**Sent:** Wednesday, March 03, 2004 9:10 AM  
**To:** Butler, Douglas  
**Subject:** PLUS Results for 10630158

Here are the PLUS search results for 10630158.

This search was prepared by the staff of the Scientific and Technical Information Center, SIRA. If you have questions or comments about this search, please reply via email to PLUS@uspto.gov.



10630158\_QUAL.txt



10630158\_LIST.txt



10630158\_WEST.txt



10630158\_EAST.txt



10630158.east



10630158\_CLS.txt



10630158\_CLSTITLES.t



10630158\_WDS.txt

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## 10630158\_LIST

PLUS Search Results for S/N 10630158, Searched March 03, 2004

The Patent Linguistics Utility System (PLUS) is a USPTO automated search system for U.S. Patents from 1971 to the present. PLUS is a query-by-example search system which produces a list of patents that are most closely related linguistically to the application searched. This search was prepared by the staff of the Scientific and Technical Information Center, SIRA.

4406597	4269082	3697199
4456060	4273520	3643432
4483662	4284943	3635081
4526048	4400141	3912420
4545737	4490094	3889579
4346620	4949784	3802802
4354395	4993448	4047384
5509475	5209495	4049365
4390321	5275540	4157117
4501119	5382142	4171185
4461187	5472326	4099571
5441389	5593289	4114375
4445674	5678981	4243361
5735170	5771968	4257751
4176714	5934303	4262742
4354397	6105671	4267888
4375946	6182751	4285401
4571162	4286928	4286656
4963078	4392792	4289294
5018350	4401396	4296678
5230607	4406122	4297088
5281109	4512149	4297087
5309992	4546607	4299545
5409356	4552220	4305461
5549156	4572012	4306463
6446946	4781543	RE31016
6481987	4781547	4315699
5567138	4788873	4320799
5586602	4790376	4329124
6015010	4876018	4350080
4631954	RE33163	4350478
4571939	4919560	4353445
4997037	5006044	4355307
4414808	5222867	4360320
5826862	5284422	4362478
5062616	5404767	4366861
5857665	5406482	4368909
5362206	5407333	4373873
4490095	5511619	4380150
4540348	5589633	4383803
4565496	5782608	4390326
4935685	5819849	4393927
5423224	5820350	4395204
4406561	5831353	4401159
4500224	5868029	4403884
4538339	5941305	4403919
4570718	RE36362	4411546
5224834	6041856	4416329
5246076	6152223	4418609
5620048	3706234	4431052

10630158\_CLS  
Most Frequently Occurring Classifications of Patents Returned  
From A Search of 10630158 on March 03, 2004

Original Classifications

6	60/372
6	74/41
6	417/12
5	166/369
5	166/68
5	166/68.5
5	417/554
3	267/64.17
3	417/378
3	417/53
2	137/13
2	166/105
2	166/249
2	166/53
2	403/343
2	417/18
2	417/42
2	417/434
2	417/444
2	417/454
2	417/46
2	417/545

Cross-Reference Classifications

11	417/53
9	74/41
9	417/18
8	417/554
7	166/68
6	417/390
6	417/904
5	60/372
5	92/137
5	166/105
5	417/63
4	74/110
4	166/72
4	417/399
3	60/381
3	60/414
3	74/581
3	74/583
3	91/275
3	166/53
3	166/68.5
3	417/44.1
2	60/369
2	60/416
2	60/476
2	73/168
2	74/108
2	91/218
2	138/140
2	166/105.5

2 166/106  
2 166/112  
2 166/176  
2 166/177.1  
2 166/177.2  
2 166/242.1  
2 166/369  
2 166/371  
2 166/66.4  
2 173/189  
2 267/125  
2 267/153  
2 280/764.1  
2 403/284  
2 403/361  
2 417/12  
2 417/15  
2 417/212  
2 417/223  
2 417/313  
2 417/36  
2 417/38  
2 417/392  
2 417/401  
2 417/402  
2 417/415  
2 417/417  
2 417/43  
2 417/430  
2 417/431  
2 417/44.11  
2 417/45  
2 417/478  
2 417/514  
2 417/520  
2 417/552  
2 417/555.2  
2 417/567  
2 417/569

## Combined Classifications

15 74/41  
14 417/53  
13 417/554  
12 166/68  
11 60/372  
11 417/18  
8 166/68.5  
8 417/12  
7 166/105  
7 166/369  
7 417/390  
6 417/63  
6 417/904  
5 92/137  
5 166/53  
5 166/72  
5 417/399  
4 74/110

4 74/583  
4 91/275  
3 60/369  
3 60/381  
3 60/414  
3 74/108  
3 74/581  
3 137/13  
3 166/105.5  
3 166/112  
3 267/64.17  
3 403/284  
3 403/343  
3 403/361  
3 417/15  
3 417/378  
3 417/401  
3 417/417  
3 417/43  
3 417/434  
3 417/44.1  
3 417/444  
3 417/45  
3 417/514  
3 417/545  
2 60/371  
2 60/416  
2 60/476  
2 73/152.61  
2 73/168  
2 91/218  
2 138/140  
2 166/106  
2 166/176  
2 166/177.1  
2 166/177.2  
2 166/242.1  
2 166/249  
2 166/311  
2 166/312  
2 166/371  
2 166/385  
2 166/66.4  
2 173/189  
2 267/125  
2 267/141  
2 267/153  
2 280/764.1  
2 318/806  
2 403/13  
2 403/268  
2 417/212  
2 417/223  
2 417/313  
2 417/36  
2 417/38  
2 417/392  
2 417/394  
2 417/400

10630158\_CLS

2 417/402  
2 417/404  
2 417/410.1  
2 417/415  
2 417/42  
2 417/430  
2 417/431  
2 417/44.11  
2 417/454  
2 417/46  
2 417/478  
2 417/520  
2 417/552  
2 417/555.2  
2 417/567  
2 417/569  
2 418/48  
2 507/205

## 10630158\_CLSTITLES

Titles of Most Frequently Occurring Classifications of Patents Returned  
From A Search of 10630158 on March 03, 2004

- 15 74/41 (6 OR, 9 XR)  
     Class 074 : MACHINE ELEMENT OR MECHANISM  
     74/840 ROTARY DRIVEN DEVICE ADJUSTABLE DURING  
             OPERATION RELATIVE TO ITS SUPPORTING STRUCTURE  
     74/25 .Rotary to or from reciprocating or oscillating  
     74/40 ..Crank, pitman, lever, and slide  
     74/41 ...Pump jack type
- 14 417/53 (3 OR, 11 XR)  
     Class 417 : PUMPS  
     417/53 PROCESSES
- 13 417/554 (5 OR, 8 XR)  
     Class 417 : PUMPS  
     417/437 EXPANSIBLE CHAMBER TYPE  
     417/545 .Valved piston  
     417/552 ..Reciprocating  
     417/554 ...Ball type
- 12 166/68 (5 OR, 7 XR)  
     Class 166 : WELLS  
     166/67 WITH BELOW AND ABOVE GROUND MODIFICATION  
     166/68 .Eduction pump or plunger in well
- 11 60/372 (6 OR, 5 XR)  
     Class 060 : POWER PLANTS  
     60/325 PRESSURE FLUID SOURCE AND MOTOR  
     60/369 .Cyclically operable reciprocating or  
             oscillating motor or output stroke device  
     60/371 ..Having means to store and release energy  
             usable to energize motor work output means  
     60/372 ...Pneumatic counter-balance of gravity load on  
             motor (e.g., deep well pump rod, etc.)
- 11 417/18 (2 OR, 9 XR)  
     Class 417 : PUMPS  
     417/1 CONDITION RESPONSIVE CONTROL OF PUMP DRIVE  
             MOTOR  
     417/18 .Single motor control element responsive to  
             means sensing diverse conditions
- 8 166/68.5 (5 OR, 3 XR)  
     Class 166 : WELLS  
     166/67 WITH BELOW AND ABOVE GROUND MODIFICATION  
     166/68 .Eduction pump or plunger in well  
     166/68.5 ..With above ground (1) motor carried by casing  
             or casing support or (2) well fluid pump
- 8 417/12 (6 OR, 2 XR)  
     Class 417 : PUMPS  
     417/1 CONDITION RESPONSIVE CONTROL OF PUMP DRIVE  
             MOTOR  
     417/12 .Having timer or delay means

## 10630158\_CLSTITLES

- 7 166/105 (2 OR, 5 XR)  
     Class 166 : WELLS  
     166/105 WITH EDUCTION PUMP OR PLUNGER
- 7 166/369 (5 OR, 2 XR)  
     Class 166 : WELLS  
     166/244.1 PROCESSES  
     166/369 .Producing the well
- 7 417/390 (1 OR, 6 XR)  
     Class 417 : PUMPS  
     417/321 MOTOR DRIVEN  
     417/375 .Fluid motor  
     417/379 ..With motive fluid generator  
     417/390 ...Fluid pump
- 6 417/63 (1 OR, 5 XR)  
     Class 417 : PUMPS  
     417/63 WITH SIGNAL, INDICATOR, OR INSPECTION MEANS
- 6 417/904 (0 OR, 6 XR)  
     Class 417 : PUMPS  
     417/904 WELL PUMP DRIVEN BY FLUID MOTOR MOUNTED ABOVE  
             GROUND
- 5 92/137 (0 OR, 5 XR)  
     Class 092 : EXPANSIBLE CHAMBER DEVICES  
     92/137 WITH FLEXIBLE TRANSMISSION ELEMENT SECURED TO  
             WORKING MEMBER
- 5 166/53 (2 OR, 3 XR)  
     Class 166 : WELLS  
     166/53 AUTOMATIC
- 5 166/72 (1 OR, 4 XR)  
     Class 166 : WELLS  
     166/67 WITH BELOW AND ABOVE GROUND MODIFICATION  
     166/72 .Above ground actuating means for below ground  
             device
- 5 417/399 (1 OR, 4 XR)  
     Class 417 : PUMPS  
     417/321 MOTOR DRIVEN  
     417/375 .Fluid motor  
     417/398 ..Rectilinearly reciprocating cylinder and  
             piston-type motor  
     417/399 ...Rectilinearly reciprocating cylinder and  
             piston-type pump
- 4 74/110 (0 OR, 4 XR)  
     Class 074 : MACHINE ELEMENT OR MECHANISM  
     74/840 ROTARY DRIVEN DEVICE ADJUSTABLE DURING  
             OPERATION RELATIVE TO ITS SUPPORTING STRUCTURE  
     74/110 .Reciprocating to reciprocating
- 4 74/583 (1 OR, 3 XR)  
     Class 074 : MACHINE ELEMENT OR MECHANISM  
     74/469 CONTROL LEVER AND LINKAGE SYSTEMS  
     74/579R .Pitmans and connecting rods



## 10630158\_CLSTITLES

- 74/581 ..Yieldable  
74/583 ...Fluid cushion
- 4 91/275 (1 OR, 3 XR)  
Class 091 : MOTORS: EXPANSIBLE CHAMBER TYPE  
91/218 CYCLICALLY OPERABLE  
91/275 .Electrically or magnetically actuated or  
adjusted distributor (459)
- 3 60/369 (1 OR, 2 XR)  
Class 060 : POWER PLANTS  
60/325 PRESSURE FLUID SOURCE AND MOTOR  
60/369 .Cyclically operable reciprocating or  
oscillating motor or output stroke device
- 3 60/381 (0 OR, 3 XR)  
Class 060 : POWER PLANTS  
60/325 PRESSURE FLUID SOURCE AND MOTOR  
60/369 .Cyclically operable reciprocating or  
oscillating motor or output stroke device  
60/381 ..Having condition responsive control of  
variable displacement pump
- 3 60/414 (0 OR, 3 XR)  
Class 060 : POWER PLANTS  
60/325 PRESSURE FLUID SOURCE AND MOTOR  
60/413 .With control means for structure storing work  
driving energy (e.g., accumulator, etc.)  
60/414 ..Energy of braking or of reversed load on  
motor stored
- 3 74/108 (1 OR, 2 XR)  
Class 074 : MACHINE ELEMENT OR MECHANISM  
74/840 ROTARY DRIVEN DEVICE ADJUSTABLE DURING  
OPERATION RELATIVE TO ITS SUPPORTING STRUCTURE  
74/99R .Reciprocating to or from oscillating  
74/102 ..Lever and slide  
74/108 ...Flexible connections
- 3 74/581 (0 OR, 3 XR)  
Class 074 : MACHINE ELEMENT OR MECHANISM  
74/469 CONTROL LEVER AND LINKAGE SYSTEMS  
74/579R .Pitmans and connecting rods  
74/581 ..Yieldable
- 3 137/13 (2 OR, 1 XR)  
Class 137 : FLUID HANDLING  
137/1 PROCESSES  
137/13 .Affecting flow by the addition of material or  
energy
- 3 166/105.5 (1 OR, 2 XR)  
Class 166 : WELLS  
166/105 WITH EDUCTION PUMP OR PLUNGER  
166/105.5 .Having liquid-gas separator
- 3 166/112 (1 OR, 2 XR)  
Class 166 : WELLS  
166/105 WITH EDUCTION PUMP OR PLUNGER

## 10630158\_CLSTITLES

- 166/112 .With leak means
- 3 267/64.17 (3 OR, 0 XR)  
 Class 267 : SPRING DEVICES  
 267/2 VEHICLE  
 267/64.11 .Comprising compressible fluid  
 267/64.15 ..With retarder  
 267/64.16 ...Leveling device  
 267/64.17 ....Self-pumping
- 3 403/284 (1 OR, 2 XR)  
 Class 403 : JOINTS AND CONNECTIONS  
 403/274 MEMBER DEFORMED IN SITU  
 403/284 .Diverse resistance to lateral deforming force
- 3 403/343 (2 OR, 1 XR)  
 Class 403 : JOINTS AND CONNECTIONS  
 403/343 SCREW OR CAM
- 3 403/361 (1 OR, 2 XR)  
 Class 403 : JOINTS AND CONNECTIONS  
 403/345 INTERFITTED MEMBERS  
 403/361 .Socket
- 3 417/15 (1 OR, 2 XR)  
 Class 417 : PUMPS  
 417/1 CONDITION RESPONSIVE CONTROL OF PUMP DRIVE  
 MOTOR  
 417/15 .With control of pump drive transmission
- 3 417/378 (3 OR, 0 XR)  
 Class 417 : PUMPS  
 417/321 MOTOR DRIVEN  
 417/375 .Fluid motor  
 417/377 ..Serial flow fluid from pumping chamber  
 through motor working chamber  
 417/378 ...Pulsator type
- 3 417/401 (1 OR, 2 XR)  
 Class 417 : PUMPS  
 417/321 MOTOR DRIVEN  
 417/375 .Fluid motor  
 417/398 ..Rectilinearly reciprocating cylinder and  
 piston-type motor  
 417/399 ...Rectilinearly reciprocating cylinder and  
 piston-type pump  
 417/401 ....Integral pump and motor pistons
- 3 417/417 (1 OR, 2 XR)  
 Class 417 : PUMPS  
 417/321 MOTOR DRIVEN  
 417/410.1 .Electric or magnetic motor  
 417/415 ..Reciprocating rigid pumping member  
 417/416 ...Reciprocating motor  
 417/417 ....Unitary pump and motor working member
- 3 417/43 (1 OR, 2 XR)  
 Class 417 : PUMPS

10630158\_CLSTITLES

- 417/1                   CONDITION RESPONSIVE CONTROL OF PUMP DRIVE  
                          MOTOR
- 417/43                .Responsive to change in rate of pump fluid  
                          flow
  
- 3   417/434            (2 OR, 1 XR)  
      Class   417 :   PUMPS  
      417/434        INCLUDING SEPARATE PORT ON NONCYCLIC VALVE FOR  
                          DRAINING PUMP PORTION
  
- 3   417/44.1          (0 OR, 3 XR)  
      Class   417 :   PUMPS  
      417/1           CONDITION RESPONSIVE CONTROL OF PUMP DRIVE  
                          MOTOR  
      417/44.1        .By control of electric or magnetic drive motor
  
- 3   417/444          (2 OR, 1 XR)  
      Class   417 :   PUMPS  
      417/437        EXPANSIBLE CHAMBER TYPE  
      417/443        .Pressure responsive distributor opened  
                          responsive to pumping member position  
      417/444        ..Distributor in piston
  
- 3   417/45            (1 OR, 2 XR)  
      Class   417 :   PUMPS  
      417/1           CONDITION RESPONSIVE CONTROL OF PUMP DRIVE  
                          MOTOR  
      417/44.1        .By control of electric or magnetic drive motor  
      417/45          ..By changing electrical characteristic of  
                          motor or motor circuit
  
- 3   417/514          (1 OR, 2 XR)  
      Class   417 :   PUMPS  
      417/437        EXPANSIBLE CHAMBER TYPE  
      417/510        .Mechanically actuated distributor  
      417/514        ..Distributor in piston
  
- 3   417/545          (2 OR, 1 XR)  
      Class   417 :   PUMPS  
      417/437        EXPANSIBLE CHAMBER TYPE  
      417/545        .Valved piston
  
- 2   60/371            (1 OR, 1 XR)  
      Class   060 :   POWER PLANTS  
      60/325        PRESSURE FLUID SOURCE AND MOTOR  
      60/369        .Cyclically operable reciprocating or  
                          oscillating motor or output stroke device  
      60/371        ..Having means to store and release energy  
                          usable to energize motor work output means
  
- 2   60/416            (0 OR, 2 XR)  
      Class   060 :   POWER PLANTS  
      60/325        PRESSURE FLUID SOURCE AND MOTOR  
      60/413        .With control means for structure storing work  
                          driving energy (e.g., accumulator, etc.)  
      60/416        ..Plural accumulators

## 10630158\_CLSTITLES

- 2 60/476 (0 OR, 2 XR)  
     Class 060 : POWER PLANTS  
     60/325 PRESSURE FLUID SOURCE AND MOTOR  
     60/473 .Pump means moves motive fluid from one chamber  
             to an opposite chamber of opposed expansible chambers  
             having a common output  
     60/476 ..Reversible delivery from pump means
- 2 73/152.61 (1 OR, 1 XR)  
     Class 073 : MEASURING AND TESTING  
     73/152.01 BOREHOLE OR DRILLING (E.G., DRILL LOADING  
             FACTOR, DRILLING RATE, RATE OF FLUID FLOW)  
     73/152.61 .Pump test
- 2 73/168 (0 OR, 2 XR)  
     Class 073 : MEASURING AND TESTING  
     73/168 BLOWER, PUMP, AND HYDRAULIC EQUIPMENT
- 2 91/218 (0 OR, 2 XR)  
     Class 091 : MOTORS: EXPANSIBLE CHAMBER TYPE  
     91/218 CYCLICALLY OPERABLE
- 2 138/140 (0 OR, 2 XR)  
     Class 138 : PIPES AND TUBULAR CONDUITS  
     138/140 DISTINCT LAYERS
- 2 166/106 (0 OR, 2 XR)  
     Class 166 : WELLS  
     166/105 WITH EDUCTION PUMP OR PLUNGER  
     166/106 .With packer or plug
- 2 166/176 (0 OR, 2 XR)  
     Class 166 : WELLS  
     166/170 BRUSHING, SCRAPING, CUTTING OR PUNCHING-TYPE  
             CLEANERS  
     166/176 .On sucker rod
- 2 166/177.1 (0 OR, 2 XR)  
     Class 166 : WELLS  
     166/177.1 SONIC DEVICE
- 2 166/177.2 (0 OR, 2 XR)  
     Class 166 : WELLS  
     166/177.1 SONIC DEVICE  
     166/177.2 .With specific downhole feature
- 2 166/242.1 (0 OR, 2 XR)  
     Class 166 : WELLS  
     166/242.1 CONDUIT WALL OR SPECIFIC CONDUIT END STRUCTURE
- 2 166/249 (2 OR, 0 XR)  
     Class 166 : WELLS  
     166/244.1 PROCESSES  
     166/249 .Vibrating the earth or material in or being  
             placed in the earth pores
- 2 166/311 (1 OR, 1 XR)  
     Class 166 : WELLS

## 10630158\_CLSTITLES

- 166/244.1 PROCESSES
- 166/311 .Cleaning or unloading well
- 2 166/312 (1 OR, 1 XR)
  - Class 166 : WELLS
  - 166/244.1 PROCESSES
  - 166/311 .Cleaning or unloading well
  - 166/312 ..Liquid introduced from well top
- 2 166/371 (0 OR, 2 XR)
  - Class 166 : WELLS
  - 166/244.1 PROCESSES
  - 166/369 .Producing the well
  - 166/371 ..Including non-expulsive material placed in well
- 2 166/385 (1 OR, 1 XR)
  - Class 166 : WELLS
  - 166/244.1 PROCESSES
  - 166/381 .Placing or shifting well part
  - 166/385 ..Flexible cable or wire
- 2 166/66.4 (0 OR, 2 XR)
  - Class 166 : WELLS
  - 166/65.1 WITH ELECTRICAL MEANS
  - 166/66.4 .Electrical motor (e.g., solenoid actuator)
- 2 173/189 (0 OR, 2 XR)
  - Class 173 : TOOL DRIVING OR IMPACTING
  - 173/184 WITH VEHICLE SUPPORT FOR DRIVE
  - 173/186 .Nontransporting means to support vehicle during tool operation
  - 173/187 ..Adjustable nontransporting means
  - 173/189 ...Having fluid cylinder
- 2 267/125 (0 OR, 2 XR)
  - Class 267 : SPRING DEVICES
  - 267/113 FLUID
  - 267/118 .Expansible-contractible chamber device
  - 267/124 ..Piston
  - 267/125 ...For use in well drilling or operating
- 2 267/141 (1 OR, 1 XR)
  - Class 267 : SPRING DEVICES
  - 267/136 RESILIENT SHOCK OR VIBRATION ABSORBER
  - 267/141 .Nonmetallic, resilient element
- 2 267/153 (0 OR, 2 XR)
  - Class 267 : SPRING DEVICES
  - 267/153 RUBBER
- 2 280/764.1 (0 OR, 2 XR)
  - Class 280 : LAND VEHICLES
  - 280/29 WHEELED
  - 280/727 .Attachment
  - 280/762 ..Exterior
  - 280/763.1 ...Retractable prop, support, or stabilizer
  - 280/764.1 ....With actuator for pivoted support

## 10630158\_CLSTITLES

- 2 318/806 (1 OR, 1 XR)  
 Class 318 : ELECTRICITY: MOTIVE POWER SYSTEMS  
 318/727 INDUCTION MOTOR SYSTEMS  
 318/767 .Primary circuit control  
 318/806 ..Condition responsive
- 2 403/13 (1 OR, 1 XR)  
 Class 403 : JOINTS AND CONNECTIONS  
 403/11 WITH ADJUNCTIVE PROTECTOR, BROKEN PARTS  
 RETAINER, REPAIR, ASSEMBLY OR DISASSEMBLY FEATURE  
 403/13 .Position or guide means
- 2 403/268 (1 OR, 1 XR)  
 Class 403 : JOINTS AND CONNECTIONS  
 403/265 MOLDED JOINT  
 403/268 .Socket or open cup for bonding material
- 2 417/212 (0 OR, 2 XR)  
 Class 417 : PUMPS  
 417/212 CONDITION RESPONSIVE CONTROL OF DRIVE  
 TRANSMISSION OR PUMP DISPLACEMENT
- 2 417/223 (0 OR, 2 XR)  
 Class 417 : PUMPS  
 417/212 CONDITION RESPONSIVE CONTROL OF DRIVE  
 TRANSMISSION OR PUMP DISPLACEMENT  
 417/223 .Disconnectable drive element (e.g., clutch,  
 belt, shifter, etc.)
- 2 417/313 (0 OR, 2 XR)  
 Class 417 : PUMPS  
 417/313 COMBINED
- 2 417/36 (0 OR, 2 XR)  
 Class 417 : PUMPS  
 417/1 CONDITION RESPONSIVE CONTROL OF PUMP DRIVE  
 MOTOR  
 417/36 .Responsive to accumulation of pumped liquid in  
 receiver
- 2 417/38 (0 OR, 2 XR)  
 Class 417 : PUMPS  
 417/1 CONDITION RESPONSIVE CONTROL OF PUMP DRIVE  
 MOTOR  
 417/36 .Responsive to accumulation of pumped liquid in  
 receiver  
 417/38 ..By liquid pressure sensor
- 2 417/392 (0 OR, 2 XR)  
 Class 417 : PUMPS  
 417/321 MOTOR DRIVEN  
 417/375 .Fluid motor  
 417/392 ..Common pumping and motor working member
- 2 417/394 (1 OR, 1 XR)  
 Class 417 : PUMPS  
 417/321 MOTOR DRIVEN  
 417/375 .Fluid motor  
 417/392 ..Common pumping and motor working member

## 10630158\_CLSTITLES

- 417/394           ...Collapsible common member
- 2 417/400           (1 OR, 1 XR)  
     Class 417 : PUMPS  
     417/321       MOTOR DRIVEN  
     417/375       .Fluid motor  
     417/398       ..Rectilinearly reciprocating cylinder and  
                   piston-type motor  
     417/399       ...Rectilinearly reciprocating cylinder and  
                   piston-type pump  
     417/400       ....Interconnected moving cylinder and piston
- 2 417/402           (0 OR, 2 XR)  
     Class 417 : PUMPS  
     417/321       MOTOR DRIVEN  
     417/375       .Fluid motor  
     417/398       ..Rectilinearly reciprocating cylinder and  
                   piston-type motor  
     417/399       ...Rectilinearly reciprocating cylinder and  
                   piston-type pump  
     417/401       ....Integral pump and motor pistons  
     417/402       .....Constantly applied force in education  
                   stroke direction
- 2 417/404           (1 OR, 1 XR)  
     Class 417 : PUMPS  
     417/321       MOTOR DRIVEN  
     417/375       .Fluid motor  
     417/398       ..Rectilinearly reciprocating cylinder and  
                   piston-type motor  
     417/399       ...Rectilinearly reciprocating cylinder and  
                   piston-type pump  
     417/401       ....Integral pump and motor pistons  
     417/403       .....Double acting motor piston  
     417/404       .....Double acting pump piston
- 2 417/410.1        (1 OR, 1 XR)  
     Class 417 : PUMPS  
     417/321       MOTOR DRIVEN  
     417/410.1     .Electric or magnetic motor
- 2 417/415           (0 OR, 2 XR)  
     Class 417 : PUMPS  
     417/321       MOTOR DRIVEN  
     417/410.1     .Electric or magnetic motor  
     417/415       ..Reciprocating rigid pumping member
- 2 417/42            (2 OR, 0 XR)  
     Class 417 : PUMPS  
     417/1         CONDITION RESPONSIVE CONTROL OF PUMP DRIVE  
                   MOTOR  
     417/42        .In response to pump speed
- 2 417/430           (0 OR, 2 XR)  
     Class 417 : PUMPS  
     417/430       INCLUDING MEANS TO (1) AGITATE PUMP FLUID, OR  
                   (2) PREVENT FOREIGN MATERIAL SETTLING FROM PUMP FLUID

## 10630158\_CLSTITLES

- 2 417/431 (0 OR, 2 XR)  
     Class 417 : PUMPS  
     417/430 INCLUDING MEANS TO (1) AGITATE PUMP FLUID, OR  
                     (2) PREVENT FOREIGN MATERIAL SETTLING FROM PUMP FLUID  
     417/431 .By application of separate fluid
- 2 417/44.11 (0 OR, 2 XR)  
     Class 417 : PUMPS  
     417/1 CONDITION RESPONSIVE CONTROL OF PUMP DRIVE  
                     MOTOR  
     417/44.1 .By control of electric or magnetic drive motor  
     417/44.11 ..Responsive to change in electrical operating  
                     characteristic
- 2 417/454 (2 OR, 0 XR)  
     Class 417 : PUMPS  
     417/437 EXPANSIBLE CHAMBER TYPE  
     417/454 .Including valve assembly, disassembly, or  
                     inspection facilitating means
- 2 417/46 (2 OR, 0 XR)  
     Class 417 : PUMPS  
     417/1 CONDITION RESPONSIVE CONTROL OF PUMP DRIVE  
                     MOTOR  
     417/46 .By controlling drive motor motive fluid
- 2 417/478 (0 OR, 2 XR)  
     Class 417 : PUMPS  
     417/437 EXPANSIBLE CHAMBER TYPE  
     417/478 .Inlet and discharge distributors at opposite  
                     ends of tubular flexible wall pumping chamber
- 2 417/520 (0 OR, 2 XR)  
     Class 417 : PUMPS  
     417/437 EXPANSIBLE CHAMBER TYPE  
     417/510 .Mechanically actuated distributor  
     417/520 ..Distributor abutted by or frictionally  
                     engaged with pumping member
- 2 417/552 (0 OR, 2 XR)  
     Class 417 : PUMPS  
     417/437 EXPANSIBLE CHAMBER TYPE  
     417/545 .Valved piston  
     417/552 ..Reciprocating
- 2 417/555.2 (0 OR, 2 XR)  
     Class 417 : PUMPS  
     417/437 EXPANSIBLE CHAMBER TYPE  
     417/555.1 .Fluid serially moved to opposite side of  
                     pumping member  
     417/555.2 ..Well swabs
- 2 417/567 (0 OR, 2 XR)  
     Class 417 : PUMPS  
     417/437 EXPANSIBLE CHAMBER TYPE  
     417/559 .Having pumping chamber pressure responsive  
                     distributor  
     417/567 ..Inlet and discharge distributors in coaxial



## 10630158\_CLSTITLES

## ports

- 2 417/569 (0 OR, 2 XR)  
Class 417 : PUMPS  
417/437 EXPANSIBLE CHAMBER TYPE  
417/559 .Having pumping chamber pressure responsive distributor  
417/569 ..Distributor positioned opposite pumping member end face
- 2 418/48 (1 OR, 1 XR)  
Class 418 : ROTARY EXPANSIBLE CHAMBER DEVICES  
418/48 UNLIKE HELICAL SURFACES ON RELATIVELY WOBBLING ROTATING MEMBER AND ENCOMPASSING CYLINDER (E.G., MOINEAU TYPE)
- 2 507/205 (1 OR, 1 XR)  
Class 507 : EARTH BORING, WELL TREATING, AND OIL FIELD CHEMISTRY  
507/200 WELL TREATING  
507/203 .Contains organic component  
507/205 ..Organic component contains fluorine bonded directly to carbon

10630158\_EAST

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